

## II. SOURCES OF RECHARGE WATER

There are substantial quantities of renewable water supplies available to the Tucson AMA, including CAP water, effluent, and stormwater runoff. CAP and effluent water sources are listed in Table 1. While consideration of all sources is necessary for a complete understanding of planning issues, the RRP Process focused primarily on recharge of CAP water, for reasons discussed in section D of this chapter.

### A. Central Arizona Project Water

The primary source water for recharge in the Tucson AMA is the CAP. The City of Tucson's CAP water allocation is the largest municipal and industrial (M&I) allocation in the state: 138,920 acre-feet (AF), after accounting for the recent settlement agreement between Metropolitan Domestic Water Improvement District (Metro Water District) and the City of Tucson in which 9,500 AF of Tucson's allocation was transferred to Metro Water District. Tucson's allocation was intended to cover the demand of Tucson and several other water providers in the region and allow for increasing demand associated with population growth. Allocations to other municipal providers, Indian Tribes, and the State Land Department within the AMA bring the total amount of CAP water allocated to entities in the AMA to 215,333 AF.

The CAP is the most important renewable water supply in the Tucson AMA and is critical to achievement of the Tucson AMA management goal of safe-yield. Because it is imported from outside the AMA, CAP water recharged in the AMA represents a net gain to the regional aquifer. Other surface water sources in the AMA are generally not used directly, however a portion of the water that flows in major stream channels during storm events naturally recharges groundwater within the AMA. CAP water is a relatively high quality surface water supply and meets most, but not all, maximum contaminant levels (MCLs) set by federal and state drinking water standards. However, it does require treatment prior to potable use, as do all surface water sources of drinking water.

### B. Effluent

The supply of effluent grows with population: as more water is used, more flows into the wastewater system. ADWR projects that there will be over 75,000 AF of effluent produced in the Tucson AMA in the year 2000. Direct municipal, industrial and agricultural use of effluent is expected to double to around 15,000 AF in the year 2000. About 60,000 AF of effluent could be discharged to the Santa Cruz River from two regional wastewater treatment plants in 2000. This volume would potentially be available for recharge.

More than 50,000 AF of the effluent produced in the Tucson AMA each year currently recharges naturally into the aquifer after discharge from wastewater treatment plants into the Santa Cruz River. ADWR includes the natural recharge of effluent (called "incidental" recharge) in its water budget calculations for the Tucson AMA, and it is a significant factor in determining

**Table 1. Sources of Water for Recharge in the Tucson AMA**

(Total amounts in acre-feet for the year 2000)

Entity	CAP	Effluent	Other	Comments
Bureau of Reclamation		28,200 <sup>(3)</sup>		Secretary of Interior's SAWRSA exchange water
CAWCD/CAGRD	1,500 Excess CAP <sup>(1)</sup>			projected minimum replenishment obligation
State Land Department	14,000			for Tucson AMA
Arizona Water Banking Authority	42,000 Excess CAP <sup>(1)</sup>			purchased by estimated \$2.1million in revenue from Pima County at \$50/AF
San Xavier District of TON	27,000		23,000	CAP allocation and exchange for the Secretary's effluent
Schuk Toak District of TON	10,800		5,200	CAP allocation and exchange for the Secretary's effluent
Pascua Yaqui Tribe	500			CAP allocation
Pima County		4,680		1979 IGA with City of Tucson
City of Tucson	138,920	42,120		CAP allocation and effluent from 1979 IGA
Metropolitan DWID	8,858			CAP allocation via 1997 settlement agreement with City of Tucson <sup>(2)</sup>
Town of Oro Valley	2,294			CAP allocation plus 642 AF transferred from City of Tucson <sup>(2)</sup>
Vail WC	786			CAP allocation
Spanish Trail WC	3,037			CAP allocation
Community WC of Green Valley/New Pueblo WC	1,337			CAP allocation
Green Valley WC	1,900			CAP allocation
Town of Marana	47			CAP allocation transferred from Cortaro WUA <sup>(2)</sup>
Flowing Wells Irrigation District	4,354			CAP allocation expected to be relinquished or sold
Midvale Farms	1,500			CAP allocation expected to be available to City of Tucson
<b>TOTAL</b>	<b>258,830</b>	<b>75,000</b>	<b>28,200<sup>(3)</sup></b>	

(1) Excess CAP is Colorado River water allocated to the CAP for which there is no current sub-contract to a water user.

(2) Approval of transfer is pending.

(3) This volume is currently available as effluent, however, it may be exchanged for CAP water.

SAWRSA - Southern Arizona Water Rights Settlement Act, CAWCD - Central Arizona Water Conservation District, CAGRD - Central Arizona Groundwater Replenishment District, AMA - Active Management Area, TON - Tohono O'odham Nation, IGA - Intergovernmental Agreement, DWID - Domestic Water Improvement District, WC - Water Company, WUA - Water Users Association, AF - Acre-Feet

whether the region achieves its goal of safe yield by 2025. When effluent is recharged in a managed USF for the purpose of earning credits to pump groundwater, the recharging entity receives long term storage credits from ADWR for 50 percent of the water recharged. The other 50 percent is considered the “cut to the aquifer”. However, if effluent is stored at a constructed USF, there is no cut to the aquifer, and 100% of the credits generated may be pumped in the future.

Recharge of effluent can be an important water management tool, especially when used to serve specific local water management needs. “Incidental” recharge of effluent in the Santa Cruz does not necessarily recharge at the time or place where it is most needed. An example of a project which addresses local water management needs is the annual storage and recovery project at Tucson’s Sweetwater facility, which stores effluent underground in the winter months when demand is low, so that it will be available for delivery through the reclaimed water system in the summer months when demand is high.

Regardless of the basin-wide implications, wastewater is now viewed primarily as a resource rather than a problem. The right to recharge effluent for groundwater storage credits exists in Arizona law, and owners of effluent have an incentive to exercise this right to their benefit. Under the terms of a 1979 Intergovernmental Agreement (IGA), the City of Tucson currently controls 90 percent of the effluent produced at Pima County’s metropolitan wastewater treatment facilities (Roger Road, Ina Road, and Randolph Park Treatment Plants (the Randolph Park plant is currently closed)), and the County controls the remaining 10 percent. (The Secretary of the Interior is entitled to 28,200 AF of effluent each year, taken off the top, by the terms of the Southern Arizona Water Rights Settlement Act (SAWRSA)). The IGA has been a source of conflict between the City and the County in recent years as the value of effluent as a resource has become apparent.

A separate regional effluent use planning effort is currently being conducted under the auspices of the Tucson Regional Water Council (TRWC). The Tucson Area Regional Effluent Planning Partnership consists of representatives from the City of Tucson, Pima County, other regional municipal water providers, and tribal interests focused on developing a long-range regional plan for effluent use in the Tucson AMA.

### C. Other

In past years, storm water retention has been studied as a method of increasing recharge from rain storms and mountain-front runoff. The City of Tucson and Pima County have previously considered small-scale multiple-use projects incorporating storm water recharge. No other participants have expressed interest in pursuing projects that focus primarily on stormwater at this time; therefore, consideration of artificial stormwater recharge was not specifically included in this plan. In order to accrue recharge credits from stormwater, storers have to prove that the water would otherwise have left the AMA.

#### D. Consideration of CAP, Effluent and Other Sources of Water in RRP Analysis

The Regional Recharge Plan focused first on recharge of CAP water for several reasons. It is the largest supply of renewable water currently available in the Tucson AMA. There is excess supply available now that will not be available in the future, and incentives for taking CAP water exist now that will disappear in the future. This situation creates an opportunity for storing water now for potential future shortages and additional motivation for moving quickly to use CAP water. In addition, the AWBA is recharging CAP water and is looking for suitable sites in the Tucson AMA.

Other sources of recharge water, primarily effluent and reclaimed water, were included in the general investigations of recharge issues. It was recognized that the recharge of effluent can be a useful water management tool. However, with the Tucson Area Regional Effluent Planning Partnership addressing long-range regional planning for effluent utilization, it was felt that specific identification, evaluation and inclusion of effluent recharge projects in a Regional Recharge Plan should reflect the results of that process. The Regional Recharge Plan is a “living document” designed to facilitate the addition of projects that meet criteria defined in the Plan. Therefore, effluent recharge projects recommended as a result of the on-going effluent use study can be integrated easily into the Plan in the future.